

## Ex. 4 - CBI

**Cc:** Gilham, Michael[Gilham.Michael@epa.gov]; Gairola, Sounjay[Gairola.Sounjay@epa.gov]; Thompson, Christopher[Thompson.Christopher@epa.gov]; Belser, Evan[Belser.Evan@epa.gov]; Kaul, Meetu[Kaul.Meetu@epa.gov]; Werner, Jacqueline[Werner.Jacqueline@epa.gov]  
**From:** Kimes, Jeffrey  
**Sent:** Thur 9/17/2015 10:37:55 PM  
**Subject:** TD 87 Volkswagen Enforcement - High Priority  
[TD 87 Volkswagen Enforcement.docx](#)

## Ex. 4 - CBI

See the attached TD 87 for enforcement case support.

Some of the tasks are urgent and ERG should contact the technical leads (Evan and Meetu) to begin working on the activities described.

Jeffrey Kimes  
Mobile Source Enforcement  
Office of Enforcement and Compliance Assurance, Western Field Office  
US EPA  
1595 Wynkoop St., 8MSU  
Denver, CO 80202  
303/312-6445

Enforcement Confidential: Attorney Work Product and / or Attorney Client Communications

From: Ex. 4 - CBI  
Location: Non-Responsive  
Importance: Normal  
Subject: Ex. 4, 7 Volkswagen  
Start Date/Time:  
End Date/Time: Ex. 7

Hi Meetu and Evan – I wanted to get something on the calendar to kick this off. If there are urgent needs, feel free to propose a new time or try me directly at my desk. I'm in all day Monday Ex. 7 I'll be in and out of my office today Ex. 7

Call-In Number: Ex. 7  
Participant Code: Non-Responsive

Ex. 4 - CBI

Eastern Research Group, Inc. (ERG)  
14555 Avion Parkway Suite 200  
Chantilly, VA 20151

Ex. 4 - CBI

From: Ex. 7  
Location: Non-Responsive  
Importance: Normal  
Subject: TD87 - Volkswagen  
Start Date/Time: Mon 9/21/2015 6:00:00 PM  
End Date/Time: Mon 9/21/2015 7:00:00 PM

;  
Hi Meetu and Evan – I wanted to get something on the calendar to kick this off. If there are urgent needs, feel free to propose a new time or try me directly at my desk. I’m in all day Monday (9/17). I’ll be

Ex. 7

Ex. 7

**To:** Kaul, Meetu[Kaul.Meetu@epa.gov]; Belser, Evan[Belser.Evan@epa.gov]; Orehowsky, Gregory[Orehowsky.Gregory@epa.gov]  
**From:** Ex. 4 - CBI  
**Sent:** Mon 9/21/2015 2:55:05 PM  
**Subject:** RE: TD87 - Volkswagen

I talked to her earlier this morning about the task, she will be on the call.

**From:** Kaul, Meetu [mailto:Kaul.Meetu@epa.gov]  
**Sent:** Monday, September 21, 2015 10:40 AM  
**To:** Ex. 4 - CBI; Belser, Evan <Belser.Evan@epa.gov>; Orehowsky, Gregory <Orehowsky.Gregory@epa.gov>  
**Subject:** RE: TD87 - Volkswagen

Brent,

Can Anne Wick join us on this call please?

thanks

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Ms.Meetu Kaul, Attorney-Advisor

National Marine Enforcement Coordinator  
United States Environmental Protection Agency  
Office of Civil Enforcement - Air Enforcement Division  
WJC South, Room 1117B  
1200 Pennsylvania Ave., N.W. (MC 2242A)  
Washington D.C. 20460 (Courier 20004)  
Direct: 202-564-5472  
Fax: 202-564-0069  
Email: [kaul.meetu@epa.gov](mailto:kaul.meetu@epa.gov)

-----Original Appointment-----

**From:** Ex. 4 - CBI

**Sent:** Friday, September 18, 2015 11:08 AM

**To:** Ex. 4 - CBI Kaul, Meetu; Belser, Evan

**Subject:** TD87 - Volkswagen

**When:** Monday, September 21, 2015 2:00 PM-3:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Call-In Number: Non-Responsive

Hi Meetu and Evan – I wanted to get something on the calendar to kick this off. If there are urgent needs, feel free to propose a new time or try me directly at my desk. I'm in all day Monday (9/17). I'll be in and out of my office today (9/18). Until we talk, I'll find out what we have on tap here at ERG in terms of for court reporting and German translation.

Call-In Number: Non-Responsive

Participant Code: Non-Responsive

**Ex. 4 - CBI**

**From:** Kaul, Meetu

**Required Attendees:** Orehowsky, Gregory; Van Eaton, Josh (ENRD); Engel, Bethany

**Non-Responsive**

234567

**Importance:** Normal

**Subject:** VW - Call with **Ex. 5**

**Start Date/Time:** Tue 9/22/2015 1:00:00 PM

**End Date/Time:** Tue 9/22/2015 1:30:00 PM

**From:** Kaul, Meetu

**Required Attendees:** Orehowsky, Gregory; Van Eaton, Josh (ENRD); Engel, Bethany (ENRD); **Ex. 4 - CBI**

**Location:** **Non-Responsive** Conference line **Non-Responsive** conference code **Non-Responsive** participant code

**Importance:** Normal

**Subject:** VW - Call with **Ex. 4 - CBI**

**Start Date/Time:** Tue 9/22/2015 1:00:00 PM

**End Date/Time:** Tue 9/22/2015 1:30:00 PM

**From:** Anne Wick

**Location:** Conference line **Non-Responsive** conference code **Non-Responsive** participant code **Non-Responsive**

**Importance:** Normal

**Subject:** Accepted: VW - Call with **Ex. 4 - CBI**

**Start Date/Time:** Tue 9/22/2015 1:00:00 PM

**End Date/Time:** Tue 9/22/2015 1:30:00 PM

;



To: **Ex. 4 - CBI**  
Cc: Kaul, Meetu[Kaul.Meetu@epa.gov]  
From: Jorquera, Mario  
Sent: Thur 9/24/2015 7:18:47 PM  
Subject: ERG

**Ex. 4 - CBI**

Meetu forwarded your voicemail to me. **Ex. 7**

**Ex. 7**


Thanks,

Mario

Mario Jorquera, P.E., Environmental Engineer  
Mobile Source Enforcement Branch  
Air Enforcement Division  
U.S. Environmental Protection Agency  
Phone: (202) 564-1079  
email: jorquera.mario@epa.gov

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**“Real Road, Real Driving and Real Emissions”**  
International Seminar for World Environment Day 2012  
National Institute of Environmental Research, 8<sup>th</sup> of June, 2012



## **On-road emissions of light-duty vehicles in Europe**

**Real Road, Real Driving, and Real Emissions Seminar**  
**National Institute of Environmental Research (NIER)**  
**8 June 2012, Seoul, Republic of Korea**

**Martin Weiss**  
**Pierre Bonnel**  
DG - Joint Research Centre (JRC)  
IET - Institute for Energy and Transport

## **Content**



- **The Joint Research Centre**

# Content




- **The Joint Research Centre**
- **Vehicle emissions legislation in the European Union**

# Content



- **The Joint Research Centre**
- **Vehicle emissions legislation in the European Union**
- **On-road emissions testing at the JRC**
  - **Design**
  - **Results**

## Content



- **The Joint Research Centre**
- **Vehicle emissions legislation in the European Union**
- **On-road emissions testing at the JRC**
  - Design
  - Results
- **Implications**

## The Joint Research Centre



**The Joint Research Centre (JRC) is the in-house scientific and technical service of the European Commission**

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**Mission:**

- to provide scientific advice and technical know-how to the European Commission

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**The Joint Research Centre (JRC) is the in-house scientific and technical service of the European Commission**

**Mission:**

- to provide scientific advice and technical know-how to the European Commission
- to support a wide range of EU policies independent of private or national interests

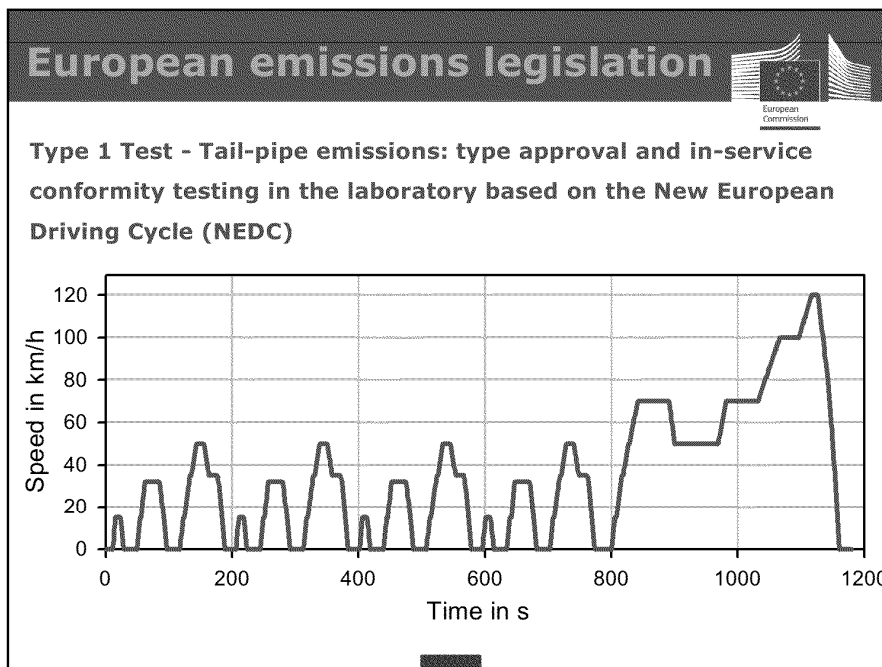
**“Real Road, Real Driving and Real Emissions”**  
International Seminar for World Environment Day 2012  
National Institute of Environmental Research, 8<sup>th</sup> of June, 2012

## The Joint Research Centre

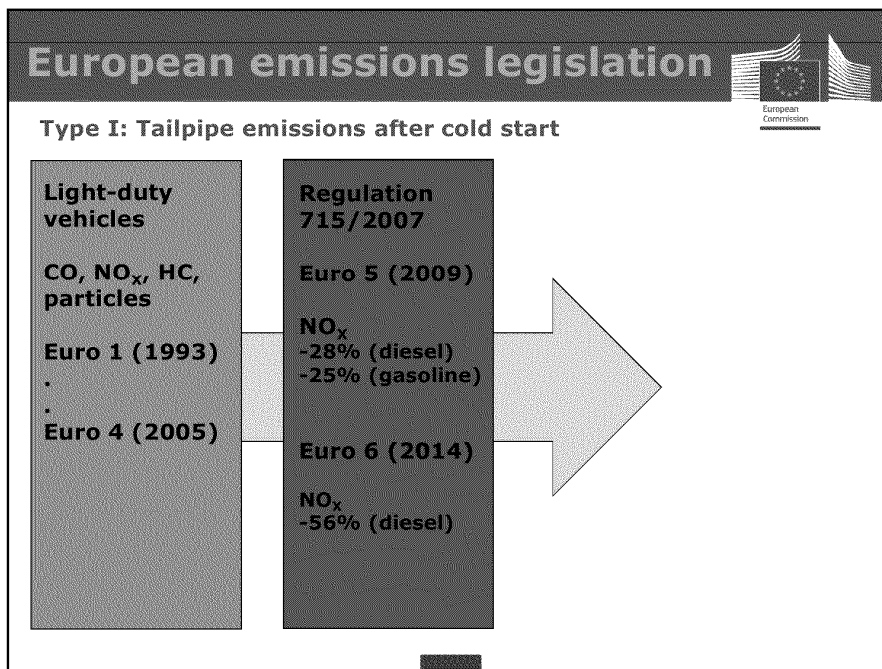
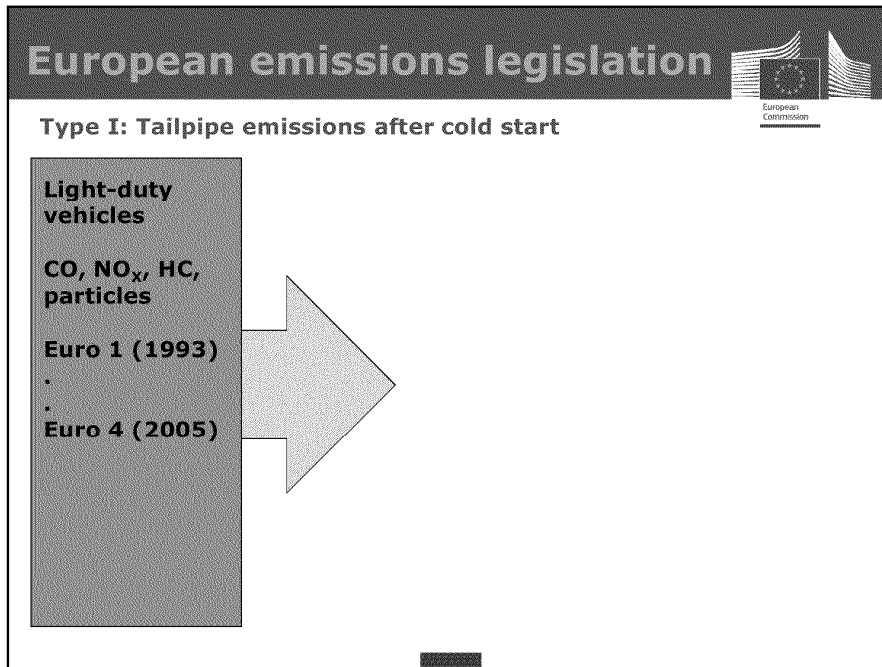
Headquarters located in Brussels  
7 institutes; 2750 employees; annual budget of €330 million  
(\$430 million)

irm  
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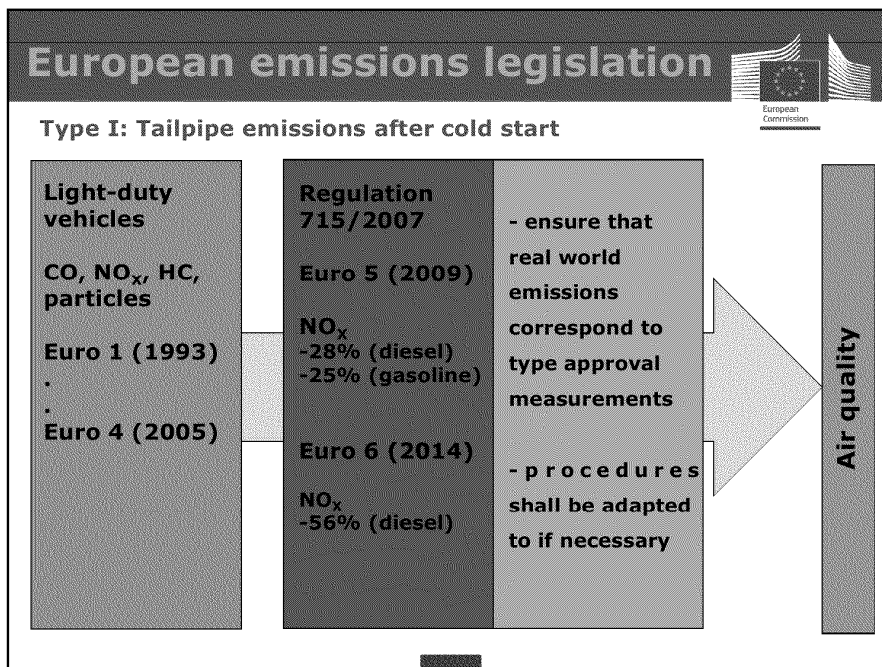
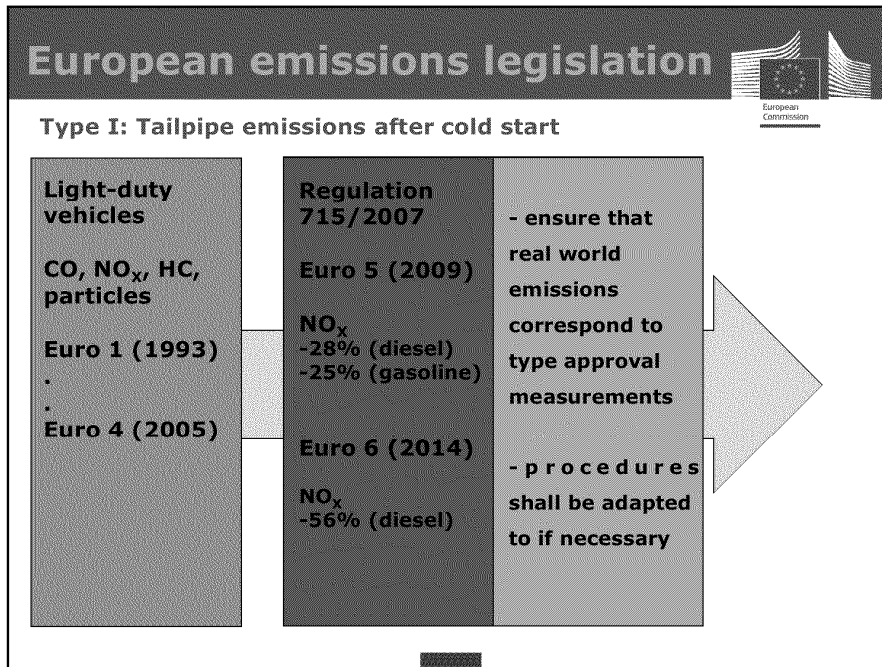
Brussels  
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International Seminar for World Environment Day 2012  
National Institute of Environmental Research, 8<sup>th</sup> of June, 2012

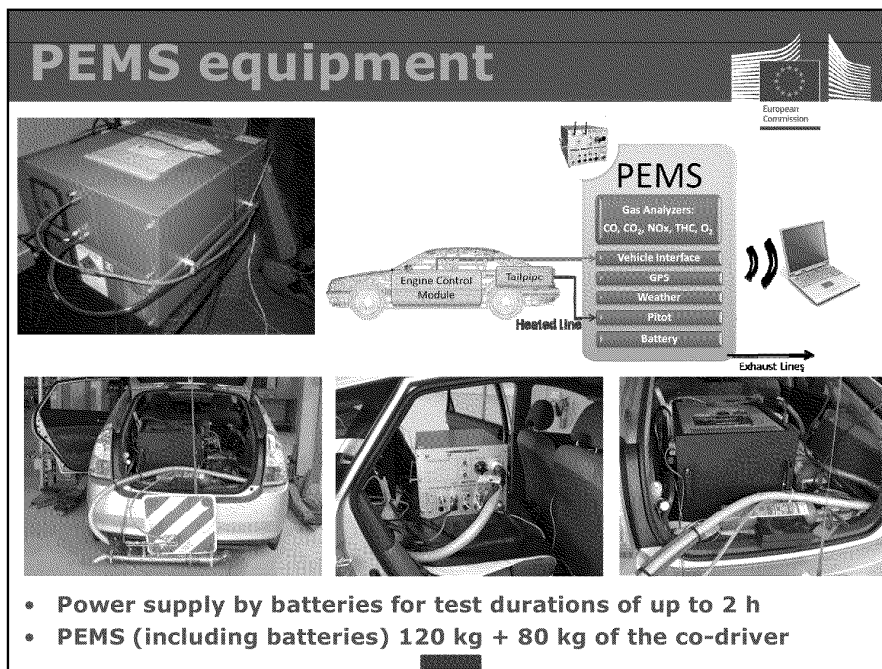
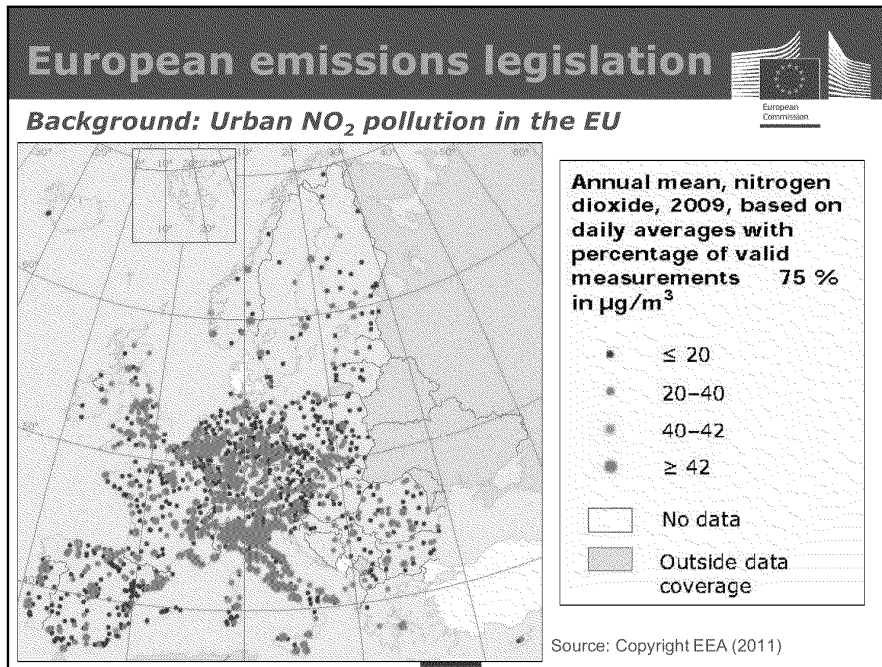


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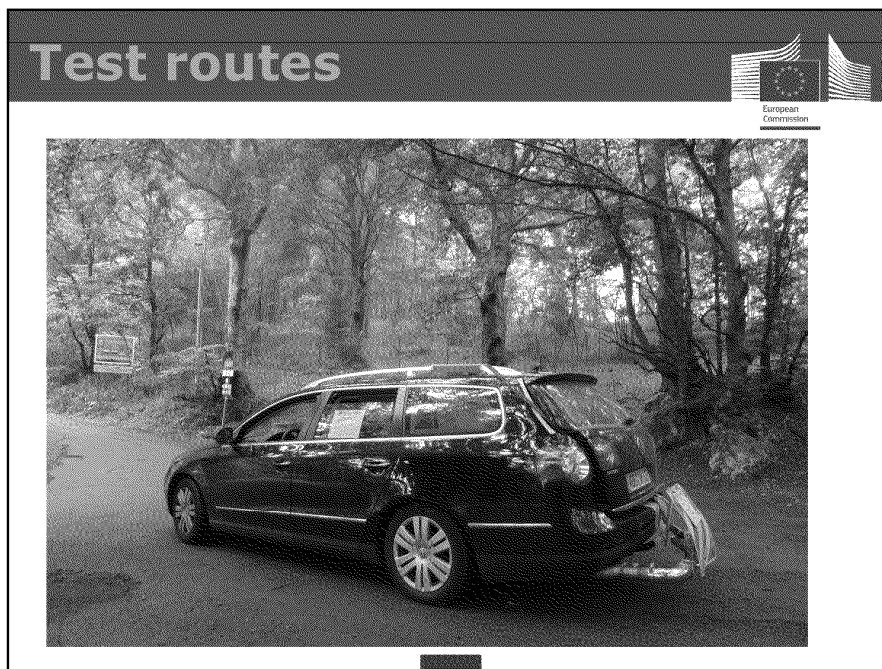
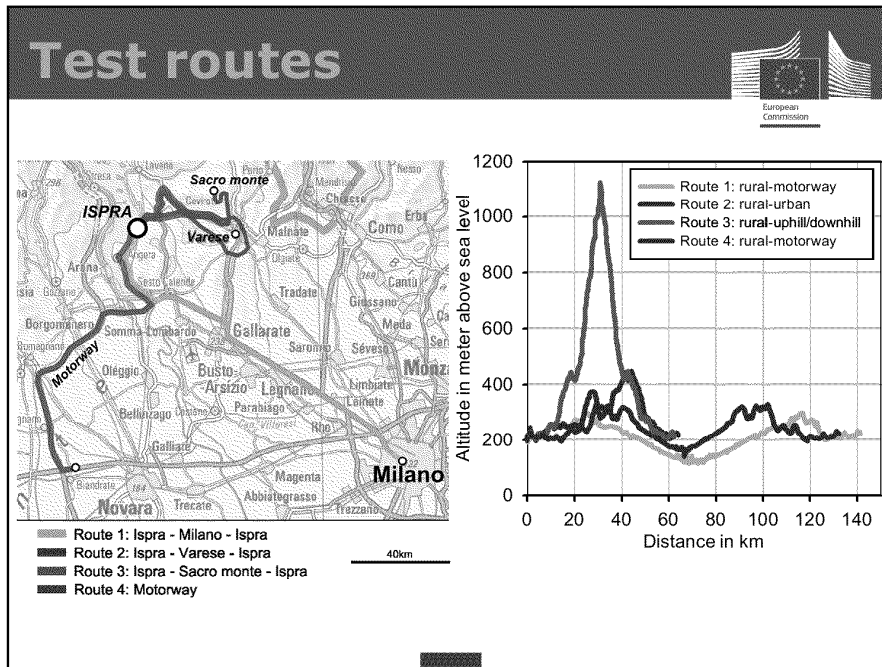




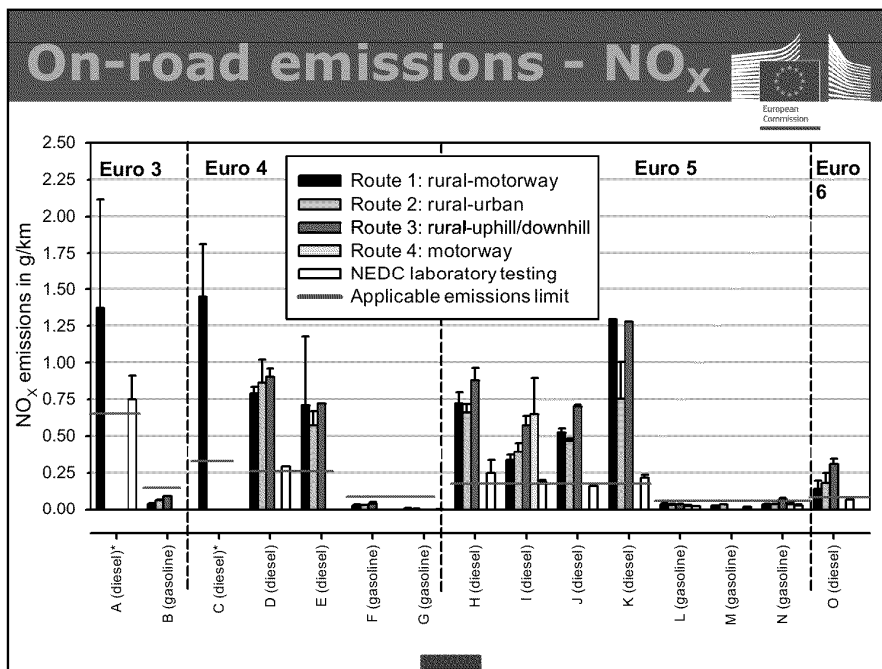
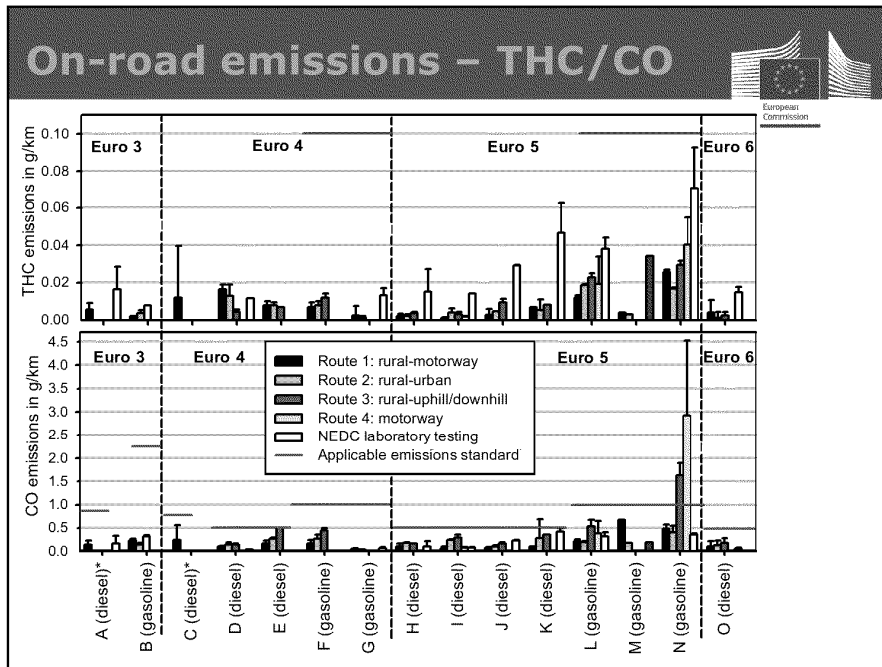
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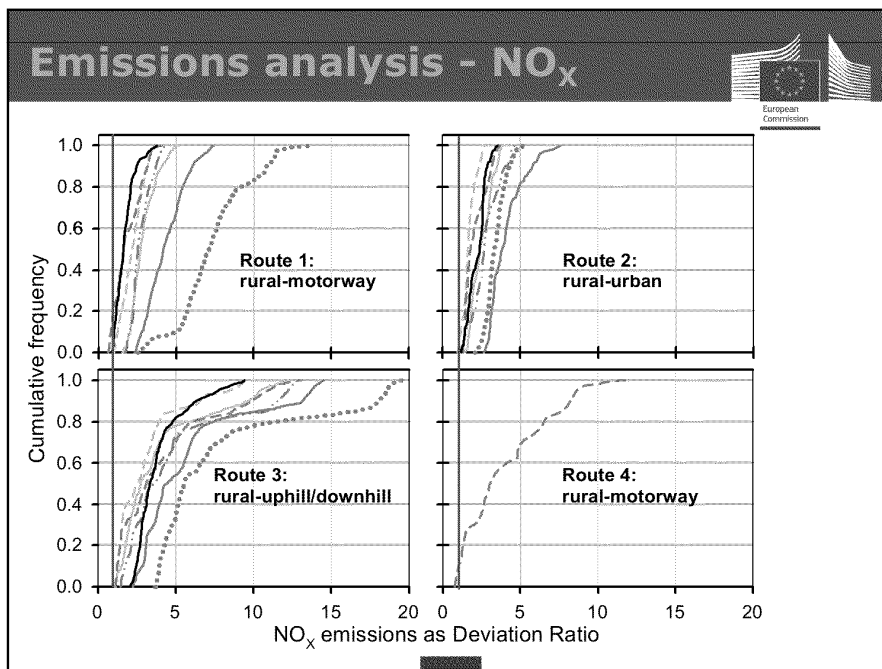
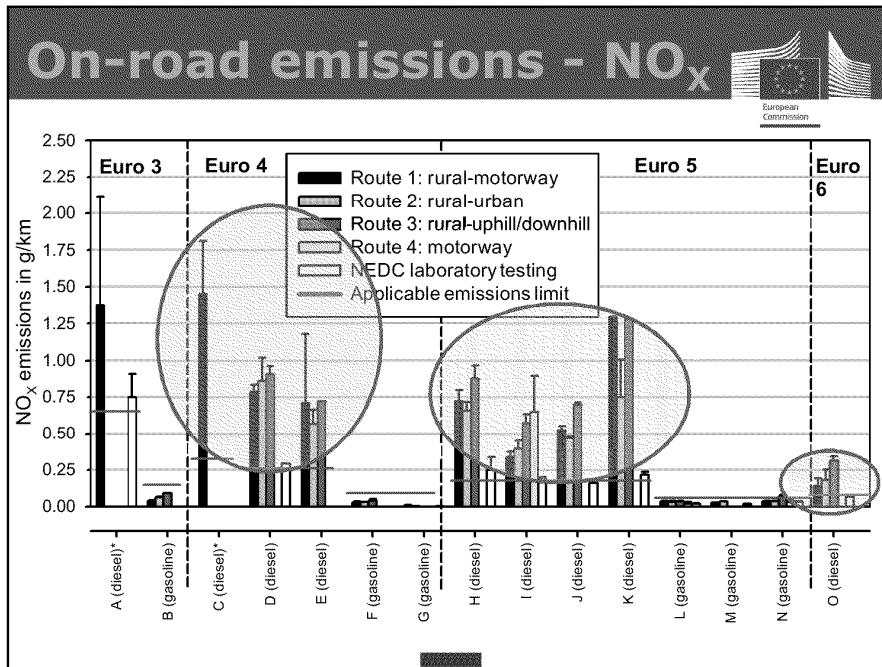
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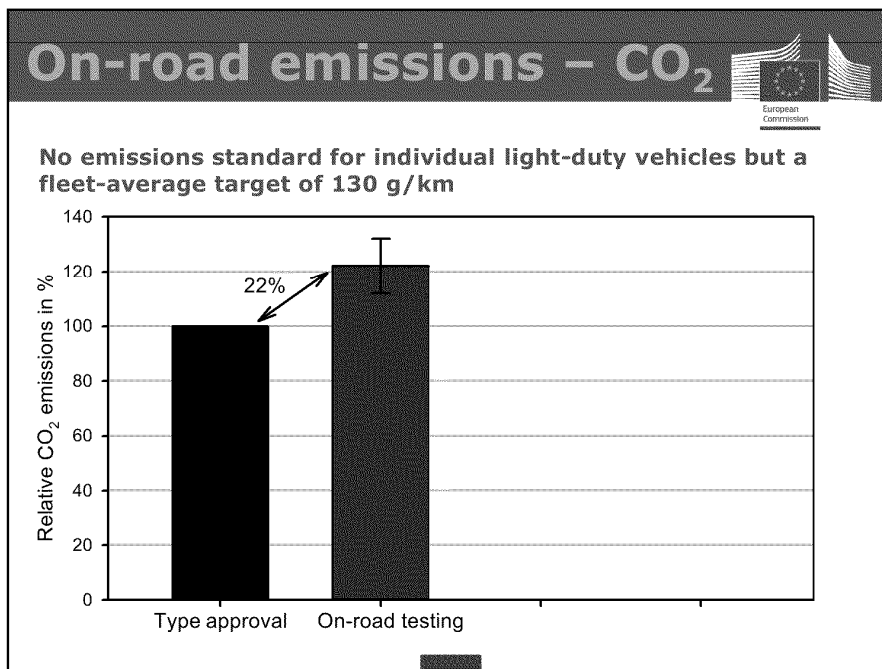
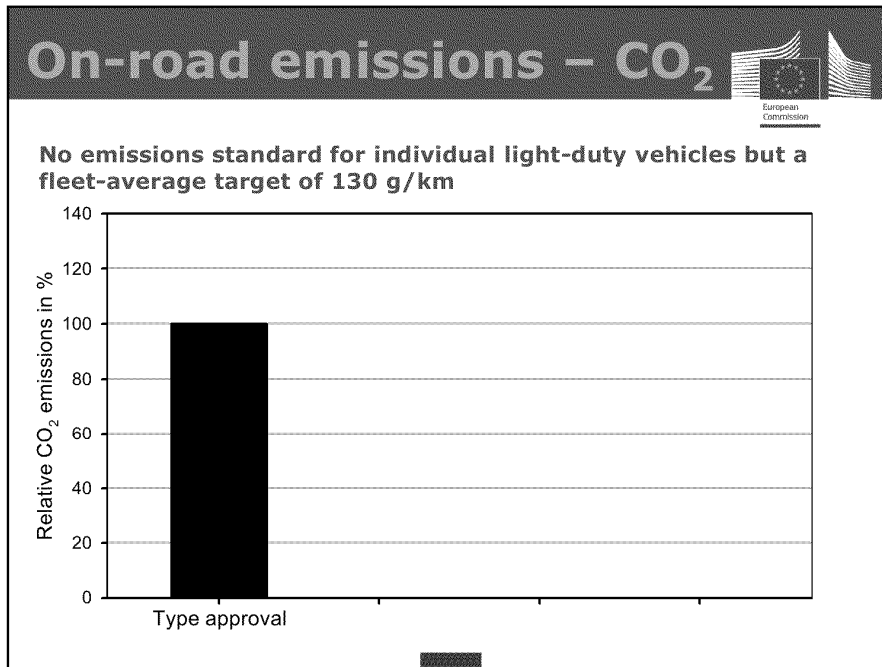
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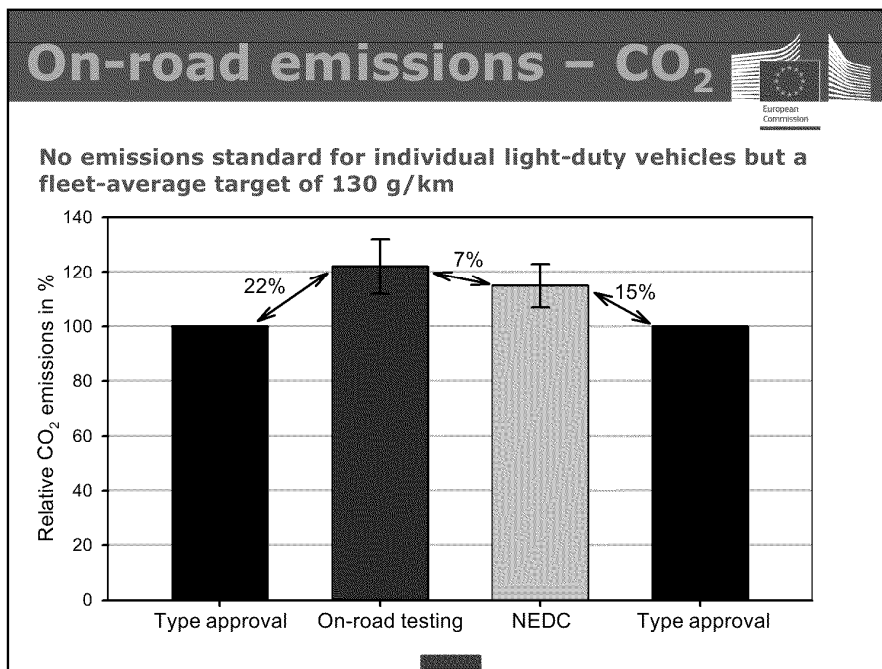
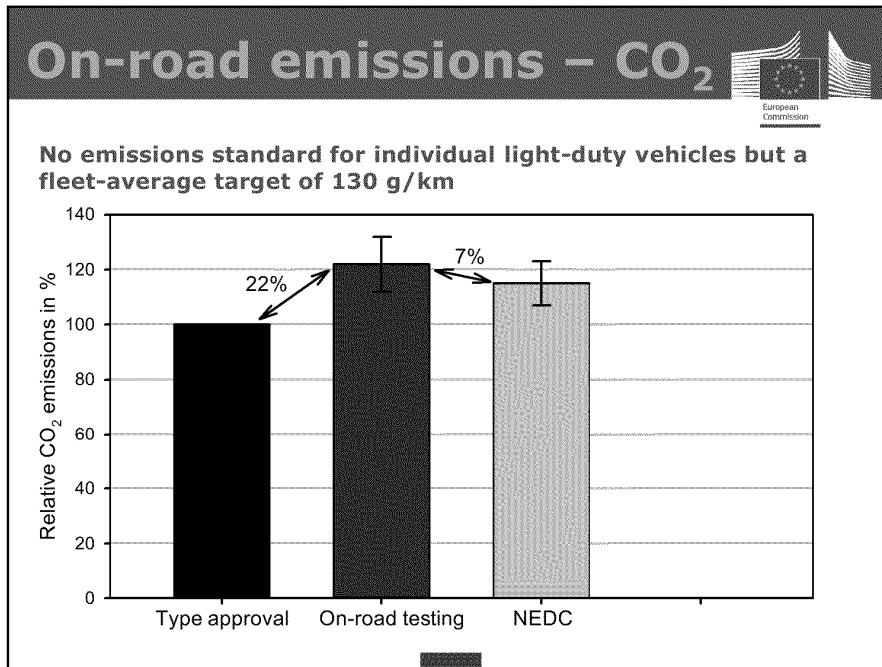
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## Implications



**European Commission establishes a complementary emissions test procedure**


- **Two candidates:**
  - **Laboratory testing with a random driving cycle**
  - **On-road emissions testing with PEMS**

## Implications




- **Factors potentially explaining elevated on-road emissions**

## Implications



- **Factors potentially explaining elevated on-road emissions**
  - **Polluting driving conditions covered only for a short time by the laboratory driving cycle**


## Implications



- **Factors potentially explaining elevated on-road emissions**
  - **Polluting driving conditions covered only for a short time by the laboratory driving cycle**
  - **Polluting driving conditions not covered in the laboratory**




## Implications



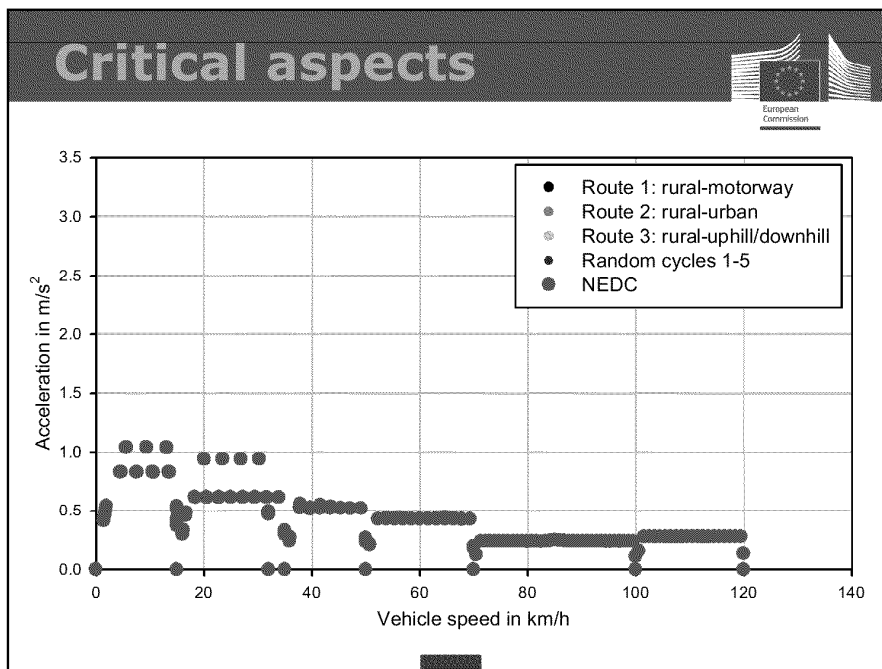
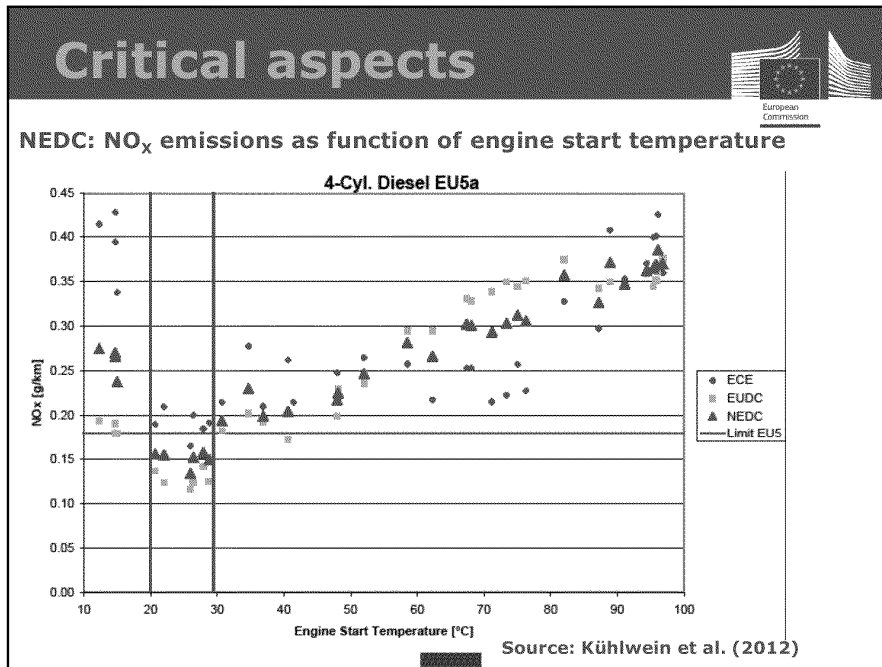
- **Factors potentially explaining elevated on-road emissions**
  - Polluting driving conditions covered only for a short time by the laboratory driving cycle
  - Polluting driving conditions not covered in the laboratory
  - Operating conditions not covered in the laboratory

## Implications

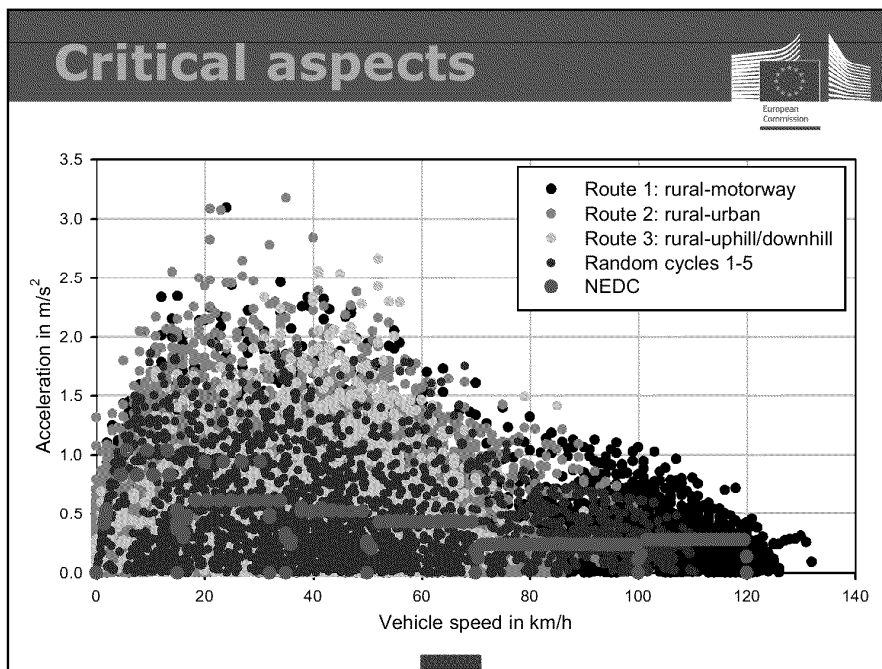
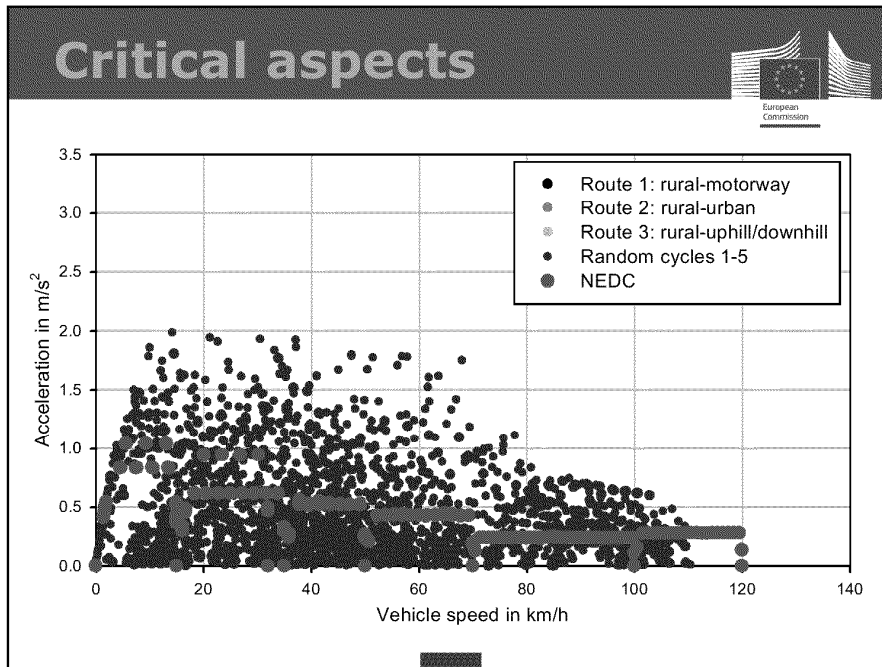


- **Factors potentially explaining elevated on-road emissions**
  - Polluting driving conditions covered only for a short time by the laboratory driving cycle
  - Polluting driving conditions not covered in the laboratory
  - Operating conditions not covered in the laboratory
  - Overall test duration

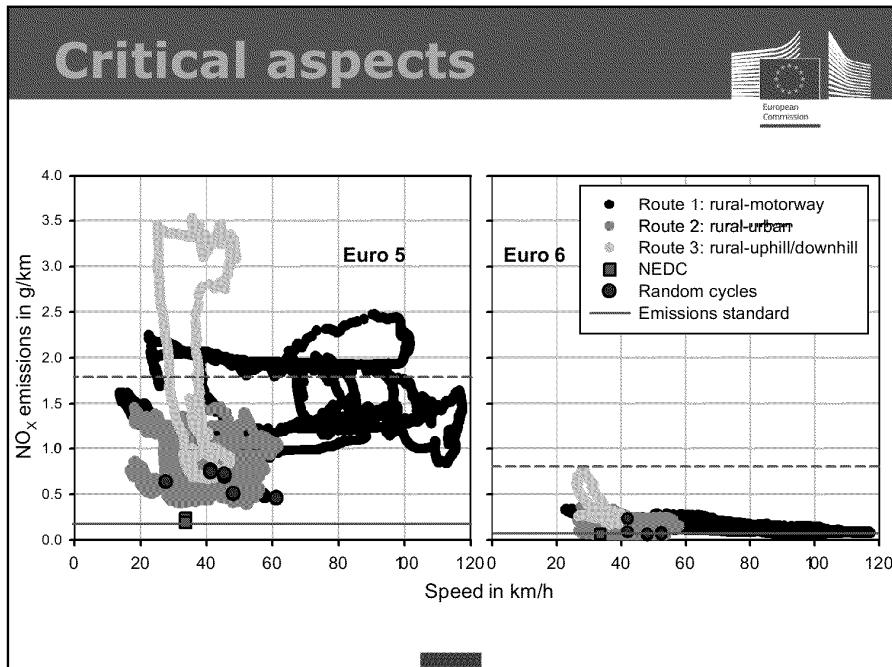
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### Outlook

- **Decision about a complementary Type1 test procedure by June 2012**


**“Real Road, Real Driving and Real Emissions”**  
International Seminar for World Environment Day 2012  
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## Outlook




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- **Gradual implementation from 2014 onwards?**

## Outlook



- **Decision about a complementary Type1 test procedure by June 2012**
- **Development and pilot testing until the end of 2013**
- **Definition of boundary conditions, data characterization, and ‘not-to-exceed’ limits**
- **Gradual implementation from 2014 onwards?**
- **NO<sub>2</sub> air pollution vs. distance-specific NO<sub>x</sub> emissions of light-duty vehicles...**

**“Real Road, Real Driving and Real Emissions”**  
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**JRC Scientific and Technical Reports**  
  
**Analyzing on-road emissions of light-duty vehicles with Portable Emission Measurement Systems (PEMS)**  
Martin Weiss, Pierre Bonnel, Rudolf Hummel, Urbano Manfredi, Rinaldo Colombo, Gaston Lanappe, Philippe Le Lijour, Mirco Scutari


**Martin Weiss**  
(martin.weiss@jrc.ec.europa.eu)


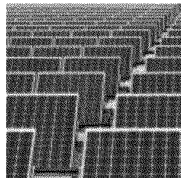
**Pierre Bonnel**  
(pierre.bonnel@jrc.ec.europa.eu)

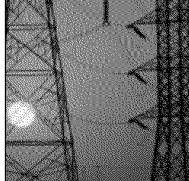

  
**On-Road Emissions of Light-Duty Vehicles in Europe**  
Martin Weiss,<sup>1,\*</sup> Pierre Bonnel,<sup>1</sup> Rudolf Hummel,<sup>1</sup> Alessio Provenza,<sup>2</sup> and Urbano Manfredi<sup>1</sup>  
<sup>1</sup>European Commission – DG Joint Research Centre, Institute for Energy and Transport, Sustainable Transport Unit, Via Enea 21/49 – IT-250, 21010 Ispra, Italy  
<sup>2</sup>Aggringrupp Informatik




## Supplemental slides

**Institute for Energy and Transport**  
• Empirical research for energy and transport policies



  
  
**Energy supply**

  
  
**Energy transmission**

  
  
  
**Energy demand**

**“Real Road, Real Driving and Real Emissions”**  
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in g/km		THC/NMHC	CO	NO <sub>x</sub>	NO <sub>x</sub> +THC	PM	PN
Euro 5 spark ignition	2009-2012	0.100/0.068	1.000	0.060	-	0.005/0.0045	-
Euro 6 spark ignition	From 2014	0.100/0.068	1.000	0.060	-	0.0045	6*10 <sup>12</sup> / 6*10 <sup>11</sup>
Euro 5 diesel	2009-2012	-	0.500	0.180	0.230	0.005/0.0045	6*10 <sup>11</sup>
Euro 6 diesel	From 2014	-	0.500	0.080	0.170	0.0045	6*10 <sup>11</sup>

**CO<sub>2</sub>: fleet-average emissions target of 130 g/km**

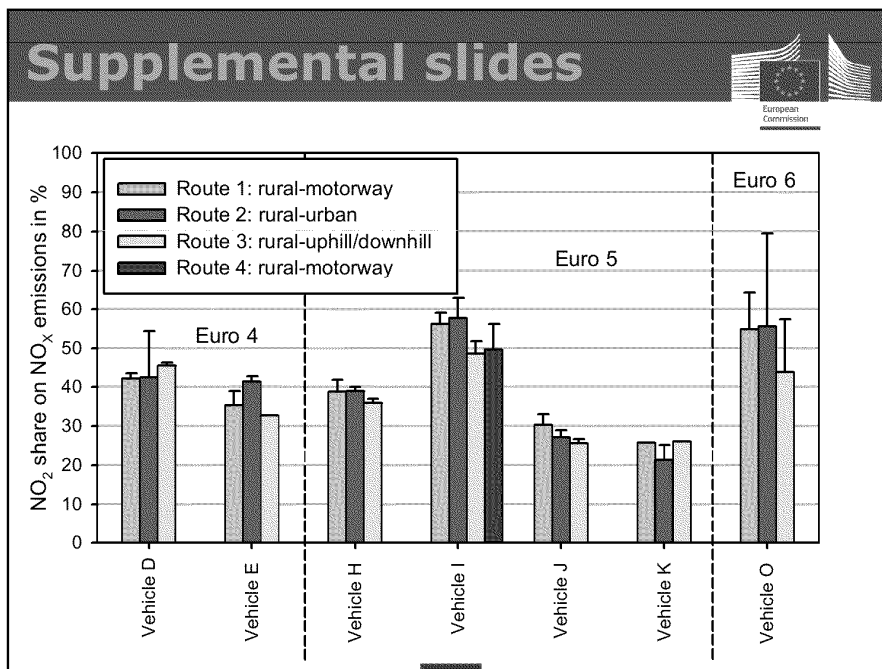
- Supplemental slides**
- **2004-2005: feasibility of PEMS for in-service conformity testing of heavy-duty vehicles**
  - **2007-2008: PEMS heavy-duty pilot program**
  - **Since 2007: PEMS testing of >15 light-duty vehicles**
  - **Since 2010: PEMS pilot program for non-road machinery**
  - **Light-duty vehicles: diesel and gasoline cars; Euro 3-6**



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Supplemental slides	
	
Parameter	Device
THC	Heated-flame ionization detector
CO+CO <sub>2</sub>	Non-dispersive infrared analyzer
NO+NO <sub>2</sub>	Non-dispersive ultraviolet analyzer
Exhaust flow rate	Exhaust flow meter (EFM)
Exhaust temperature	EFM temperature sensor
Vehicle speed	GPS/ECU
Vehicle position and altitude	GPS
Acceleration	GPS/ECU
Distance	GPS/ECU
Ambient humidity	Humidity sensor
Ambient temperature	Temperature sensor
Ambient air pressure	Barometer

- Emissions testing from cold start, including cranking
- Use of commercial fuels



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